IN THE CLAIMS

1. (Previously Presented) A method of removing a photoresist layer comprising:

positioning a substrate comprising a photoresist layer into a processing chamber;

removing the photoresist layer using a plasma;

monitoring the plasma for both a byproduct optical emission and a reagent optical emission during the process; and

stopping the etching upon the byproduct optical emission obtaining a first level and the reagent optical emission obtaining a second level.

2. (Original) The method of claim 1 wherein the photoresist layer comprises a hardened crust layer.

3-5. (Cancelled)

6. (Previously Presented) The method of claim 2, wherein the monitoring step produces signals having first levels while etching the crust and produces signals having second levels after the crust has been removed.

7. (Previously Presented) The method of claim 1, wherein the byproduct is hydrogen and the hydrogen optical emission occurs at a wavelength of about 656 nm.

8. (Cancelled)

9. (Previously Presented) The method of claim 1, wherein the reagent is oxygen and the oxygen optical emission occurs at a wavelength of about 777 nm.

10-13. (Cancelled)

14. (Previously Presented) The method of claim 6, wherein the monitoring step produces signals having a third level after the photoresist is removed.

15. (Cancelled)

16. (Previously Presented) A method of etching a photoresist layer comprising:
providing a substrate comprising a photoresist layer to a process chamber;
etching the photoresist layer using a plasma; and
monitoring the plasma for both a byproduct optical emission and a reagent optical emission while etching.

17. (Original) The method of claim 16 wherein the photoresist layer comprises a crust.

18-20. (Cancelled)

21. (Previously Presented) The method of claim 16, wherein the byproduct is hydrogen and the hydrogen optical emission occurs at a wavelength of about 656 nm.

22. (Previously Presented) The method of claim 16, wherein the reagent is oxygen and the oxygen optical emission occurs at a wavelength of about 777 nm.

23-27. (Cancelled)

28. (Previously Presented) The method of claim 1, further comprising:
comparing the monitored optical emissions to a fingerprint of a clean chamber.

29. (Cancelled)

30. (Previously Presented) The method of claim 16, further comprising:
comparing the monitored optical emissions to a fingerprint of a clean chamber.

31. (Previously Presented) The method of claim 16, further comprising:
determining the condition of a plasma source.

32. (Previously Presented) The method of claim 16 further comprising:
determining the condition of an inner surface of the processing chamber.

33. (Previously Presented) The method of claim 1, further comprising:
determining the condition of a plasma source.

34. (Previously Presented) The method of claim 1, further comprising:
determining the condition of an inner surface of the processing chamber.

35. (Previously Presented) A method of etching a photoresist layer comprising:
providing a substrate comprising a photoresist layer to a process chamber;
etching the photoresist layer using a plasma;
determining an early endpoint indicator by monitoring the plasma for a reagent optical emission while etching; and
determining a final endpoint indicator by monitoring the plasma for a byproduct optical emission while etching.

36. (Previously Presented) The method of claim 35, wherein the determining a final endpoint indicator step further comprises:
monitoring the plasma for a hydrogen optical emission while etching.

37. (Previously Presented) The method of claim 36, wherein the determining an early endpoint indicator step further comprises:
monitoring the plasma for an oxygen optical emission while etching.

38. (Previously Presented) The method of claim 35, wherein the determining an early endpoint indicator step further comprises:
monitoring the plasma for an oxygen optical emission while etching.

39. (Previously Presented) The method of claim 35 further comprising:

determining the condition of a plasma source.

40. (Previously Presented) The method of claim 35, further comprising:

determining the condition of an inner surface of the processing chamber.

41. (Previously Presented) The method of claim 1, further comprising:

determining from at least one of the monitored optical emissions whether a cleaning cycle is necessary, whether components within the chamber are degrading, or both.

42. (Previously Presented) The method of claim 1, wherein the monitoring step further comprises:

determining an early endpoint indicator from the reagent optical emission.

43. (Previously Presented) The method of claim 1, wherein the monitoring step further comprises:

determining a final endpoint indicator from the byproduct optical emission.

44. (Previously Presented) The method of claim 16, further comprising:

determining from at least one of the monitored optical emissions whether a cleaning cycle is necessary, whether components within the chamber are degrading, or both.

45. (Previously Presented) The method of claim 35, further comprising:

determining from at least one of the monitored optical emissions whether a cleaning cycle is necessary, whether components within the chamber are degrading, or both.